

Pediatric EM Critical Appraisal: The Swallowed Coin

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Clinical bottom line : "Watchful waiting" may be an appropriate approach for the management of asymptomatic children with esophageal coins

Abstract: In asymptomatic children with esophageal coins, the approach of "observing the child for 8-16 hours prior endoscopy" was found to be as safe as the approach of "removing the coin by as soon as the endoscopy team is ready"

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MeSH Words: Coins, Swallowed, Watchful Waiting

The Study: Randomized, controlled trial of a convenience sample of children admitted to the Emergency Department of the Children's hospital in Boston from March 1, 2001 to December 1, 2003.

Population: Inclusion criteria were patients aged 21 years or younger who ingested coins that lodged in the esophagus. Exclusion criteria: patients who had prior tracheal or esophageal surgery, presence of respiratory distress, drooling

or choking, or when the ingestion occurred > 24 hours earlier or inability to ascertain the time from ingestion.

Design: Patients were randomly entered into one of the following arms of the study:

Study group (Observation group. N = 30; 30 analyzed). 8 to 16 hour period of in-hospital observation under NPO and monitoring.

Figure 1: Results

Outcome	Observation (n=30)	Endoscopy (n=30)	P*
Undergoing endoscopy, n/N (%)	23/30 (77)	21/30 (77)	NS
Spontaneous passage, (%)			
Proximal 1/3	1 (14)	1 (11)	
Middle 1/3	3 (43)	2 (22)	
Distal 1/3	3 (43)	6 (67)	
Mean length of stay, h (SD)	19.4±10 (2.1-43)	10.7±7.1(1.5-32.3)	<0.01
Complications	0	0	NS

* Wilcoxon rank-sum test. NS indicates not significant

Control group (Endoscopy group. N = 30; 30 analyzed).

The coin was extracted under general anesthesia by using rigid endoscopy as soon as the Surgeon performing the endoscopy, the Anesthesiologist and the operating room were available.

Outcome measures: proportion of patients in each group requiring endoscopy, hospital length of stay in each group, and potential complications associated with each strategy.

Results

See Figure 1

EBM analysis

Patient selection

Out of 81 eligible patients, 21 (26%) were not enrolled due to failure to contact the principal investigator (1 of 21) or refusal of informed consent (20 of 21). 60 patients were enrolled and completed follow up. Drop-out rate of only 1 of 60 seems very good, but failure in enrolling quarter of the patients raises questions regarding a possible bias in patient selection.

Another concerning problem is that the diagnostic criteria for entry to the trial included age of 21 years or less, which is not the pediatric range.

Randomization and demographics

A concealed randomization technique was used which produced comparable groups. The two

groups showed similar demographic characteristics in age, gender, and coin type, but the distribution of coin location was not comparable in both groups. This could influence the outcome measure of spontaneous passage (by chance variation between the two groups).

Confounding

The investigators did not restrict the observation time prior endoscopy in the 2 groups to a defined period of time (e.g. 8-16 hours in the observation group, and less than 8 hours in the endoscopy group). It is clear that in both groups the observation time prior to endoscopy was strongly associated with a third variable, the availability of the endoscopist/anesthesiologist/OR. Since some patients from both groups had an observation time prior endoscopy that was different than the one expected on enrollment, a confounding error is highly suspected.

Validity of the hospital mean-length-of-stay

The Confidence Interval (CI) of the mean-length-of-stay in both groups is too large; 2.1-43 hours in the observation group, and 1.5-32.3 hours in the endoscopy group. This wide CI suggests that the comparison between the 2 groups has poor significance. Moreover, using the parameter of total hospital length-of-stay for the comparison between the groups raises questions regarding the validity the comparison between the groups.

Comments

- This is the first randomized prospective study comparing two strategies of management in children with esophageal coins.

- The study provided two important findings:

First, no complications were found in both groups. This could be the result of excluding symptomatic patients from the study or due to the relatively small number of patients enrolled. (When using the observation strategy, one has to bear in mind that a complication such as tracheal aspiration is a major concern in these patients).
Second, spontaneous passage occurred in 25% of the patients, more commonly in older patients (mean age 66 months), in males, and when the coin was located in the distal esophagus. When assessing the effect of multiple predictors of spontaneous passage using logistic regression analysis, coin location was found to be the strongest predictor.

"My 2 cents"

Based on the results of this study and until we have some more solid evidence; the approach of "watchful waiting" should only be considered in the asymptomatic child with a mid-to-distal esophageal coin, who presented to the ED during after hours, when an "in house" endoscopist is not available.

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